

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/856,025

DATE: 05/29/2001

TIME: 15:55:30

Input Set : A:\W098519.txt

Output Set: C:\CRF3\05292001\I856025.raw

3 <110> APPLICANT: Iogen Corporation  
 5 <120> TITLE OF INVENTION: Xylanases with Improved Performance in Feed Pelleting  
 6 Applications  
 8 <130> FILE REFERENCE: 08881610WO

C--&gt; 10 &lt;140&gt; CURRENT APPLICATION NUMBER: US/09/856,025

C--&gt; 11 &lt;141&gt; CURRENT FILING DATE: 2001-05-16

13 &lt;150&gt; PRIOR APPLICATION NUMBER: 60/108,504

14 &lt;151&gt; PRIOR FILING DATE: 1998-11-16

16 &lt;160&gt; NUMBER OF SEQ ID NOS: 61

18 &lt;170&gt; SOFTWARE: PatentIn Ver. 2.1

20 &lt;210&gt; SEQ ID NO: 1

21 &lt;211&gt; LENGTH: 184

22 &lt;212&gt; TYPE: PRT

23 &lt;213&gt; ORGANISM: Aspergillus niger

25 &lt;400&gt; SEQUENCE: 1

ENTERED

26 Ser Ala Gly Ile Asn Tyr Val Gln Asn Tyr Asn Gly Asn Leu Gly Asp  
 27 1 5 10 15  
 29 Phe Thr Tyr Asp Glu Ser Ala Gly Thr Phe Ser Met Tyr Trp Glu Asp  
 30 20 25 30  
 32 Gly Val Ser Ser Asp Phe Val Val Gly Leu Gly Trp Thr Thr Gly Ser  
 33 35 40 45  
 35 Ser Asn Ala Ile Thr Tyr Ser Ala Glu Tyr Ser Ala Ser Gly Ser Ser  
 36 50 55 60  
 38 Ser Tyr Leu Ala Val Tyr Gly Trp Val Asn Tyr Pro Gly Ala Glu Tyr  
 39 65 70 75 80  
 41 Tyr Ile Val Glu Asp Tyr Gly Asp Tyr Asn Pro Cys Ser Ser Ala Thr  
 42 85 90 95  
 44 Ser Leu Gly Thr Val Tyr Ser Asp Gly Ser Thr Tyr Gln Val Cys Thr  
 45 100 105 110  
 47 Asp Thr Arg Ile Asn Glu Pro Ser Ile Thr Gly Thr Ser Thr Phe Thr  
 48 115 120 125  
 50 Gln Tyr Phe Ser Val Arg Glu Ser Thr Arg Thr Ser Gly Thr Val Thr  
 51 130 135 140  
 53 Val Ala Asn His Phe Asn Phe Trp Ala Gln His Gly Phe Gly Asn Ser  
 54 145 150 155 160  
 56 Asp Phe Asn Tyr Gln Val Met Ala Val Glu Ala Trp Ser Gly Ala Gly  
 57 165 170 175  
 59 Ser Ala Ser Val Thr Ile Ser Ser  
 60 180

63 &lt;210&gt; SEQ ID NO: 2

64 &lt;211&gt; LENGTH: 185

65 &lt;212&gt; TYPE: PRT

66 &lt;213&gt; ORGANISM: Aspergillus tubingensis

68 &lt;400&gt; SEQUENCE: 2

69 Ser Ala Gly Ile Asn Tyr Val Gln Asn Tyr Asn Gln Asn Leu Gly Asp  
 70 1 5 10 15  
 72 Phe Thr Tyr Asp Glu Ser Ala Gly Thr Phe Ser Met Tyr Trp Glu Asp

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73          20          25          30
75 Gly Val Ser Ser Asp Phe Val Val Gly Leu Gly Gly Trp Thr Thr Gly
76          35          40          45
78 Ser Ser Asn Ala Ile Thr Tyr Ser Ala Glu Tyr Ser Ala Ser Gly Ser
79          50          55          60
81 Ala Ser Tyr Leu Ala Val Tyr Gly Trp Val Asn Tyr Pro Gln Ala Glu
82 65          70          75          80
84 Tyr Tyr Ile Val Glu Asp Tyr Gly Asp Tyr Asn Pro Cys Ser Ser Ala
85          85          90          95
87 Thr Ser Leu Gly Thr Val Tyr Ser Asp Gly Ser Thr Tyr Gln Val Cys
88          100          105          110
90 Thr Asp Thr Arg Ile Asn Glu Pro Ser Ile Thr Gly Thr Ser Thr Phe
91          115          120          125
93 Thr Gln Tyr Phe Ser Val Arg Glu Ser Thr Arg Thr Ser Gly Thr Val
94          130          135          140
96 Thr Val Ala Asn His Phe Asn Phe Trp Ala His His Gly Phe His Asn
97 145          150          155          160
99 Ser Asp Phe Asn Tyr Gln Val Val Ala Val Glu Ala Trp Ser Gly Ala
100          165          170          175
102 Gly Ser Ala Ala Val Thr Ile Ser Ser
103          180          185
106 <210> SEQ ID NO: 3
107 <211> LENGTH: 185
108 <212> TYPE: PRT
109 <213> ORGANISM: Bacillus circulans
111 <400> SEQUENCE: 3
112 Ala Ser Thr Asp Tyr Trp Gln Asn Trp Thr Asp Gly Gly Gly Ile Val
113 1          5          10          15
115 Asn Ala Val Asn Gly Ser Gly Gly Asn Tyr Ser Val Asn Trp Ser Asn
116          20          25          30
118 Thr Gly Asn Phe Val Val Gly Lys Gly Trp Thr Thr Gly Ser Pro Phe
119          35          40          45
121 Arg Thr Ile Asn Tyr Asn Ala Gly Val Trp Ala Pro Asn Gly Asn Gly
122          50          55          60
124 Tyr Leu Thr Leu Tyr Gly Trp Thr Arg Ser Pro Leu Ile Glu Tyr Tyr
125 65          70          75          80
127 Val Val Asp Ser Trp Gly Thr Tyr Arg Pro Thr Gly Thr Tyr Lys Gly
128          85          90          95
130 Thr Val Lys Ser Asp Gly Gly Thr Tyr Asp Ile Tyr Thr Thr Arg
131          100          105          110
133 Tyr Asn Ala Pro Ser Ile Asp Gly Asp Arg Thr Thr Phe Thr Gln Tyr
134          115          120          125
136 Trp Ser Val Arg Gln Ser Lys Arg Pro Thr Gly Ser Asn Ala Thr Ile
137          130          135          140
139 Thr Phe Thr Asn His Val Asn Ala Trp Lys Ser His Gly Met Asn Leu
140 145          150          155          160
142 Gly Ser Asn Trp Ala Tyr Gln Val Met Ala Thr Glu Gly Tyr Gln Ser
143          165          170          175
145 Ser Gly Ser Ser Asn Val Thr Val Trp

```

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146          180          185
149 <210> SEQ ID NO: 4
150 <211> LENGTH: 201
151 <212> TYPE: PRT
152 <213> ORGANISM: Bacillus pumilus
154 <400> SEQUENCE: 4
155 Arg Thr Ile Thr Asn Asn Glu Met Gly Asn His Ser Gly Tyr Asp Tyr
156   1          5          10          15
158 Glu Leu Trp Lys Asp Tyr Gly Asn Thr Ser Met Thr Leu Asn Asn Gly
159          20          25          30
161 Gly Ala Phe Ser Ala Gly Trp Asn Asn Ile Gly Asn Ala Leu Phe Arg
162          35          40          45
164 Lys Gly Lys Lys Phe Asp Ser Thr Arg Thr His His Gln Leu Gly Asn
165          50          55          60
167 Ile Ser Ile Asn Tyr Asn Ala Ser Phe Asn Pro Ser Gly Asn Ser Tyr
168   65          70          75          80
170 Leu Cys Val Tyr Gly Trp Thr Gln Ser Pro Leu Ala Glu Tyr Tyr Ile
171          85          90          95
173 Val Asp Ser Trp Gly Thr Tyr Arg Pro Thr Gly Ala Tyr Lys Gly Ser
174          100         105         110
176 Phe Tyr Ala Asp Gly Gly Thr Tyr Asp Ile Tyr Glu Thr Thr Arg Val
177          115         120         125
179 Asn Gln Pro Ser Ile Ile Gly Ile Ala Thr Phe Lys Gln Tyr Trp Ser
180          130         135         140
182 Val Arg Gln Thr Lys Arg Thr Ser Gly Thr Val Ser Val Ser Ala His
183 145         150         155         160
185 Phe Arg Lys Trp Glu Ser Leu Gly Met Pro Met Gly Lys Met Tyr Glu
186          165         170         175
188 Thr Ala Phe Thr Val Glu Gly Tyr Gln Ser Ser Gly Ser Ala Asn Val
189          180         185         190
191 Met Thr Asn Gln Leu Phe Ile Gly Asn
192          195         200
195 <210> SEQ ID NO: 5
196 <211> LENGTH: 185
197 <212> TYPE: PRT
198 <213> ORGANISM: Bacillus subtilis
200 <400> SEQUENCE: 5
201 Ala Ser Thr Asp Tyr Trp Gln Asn Trp Thr Asp Gly Gly Gly Ile Val
202   1          5          10          15
204 Asn Ala Val Asn Gly Ser Gly Gly Asn Tyr Ser Val Asn Trp Ser Asn
205          20          25          30
207 Thr Gly Asn Phe Val Val Gly Lys Gly Trp Thr Thr Gly Ser Pro Phe
208          35          40          45
210 Arg Thr Ile Asn Tyr Asn Ala Gly Val Trp Ala Pro Asn Gly Asn Gly
211          50          55          60
213 Tyr Leu Thr Leu Tyr Gly Trp Thr Arg Ser Pro Leu Ile Glu Tyr Tyr
214   65          70          75          80
216 Val Val Asp Ser Trp Gly Thr Tyr Arg Pro Thr Gly Thr Tyr Lys Gly
217          85          90          95

```

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219 Thr Val Lys Ser Asp Gly Gly Thr Tyr Asp Ile Tyr Thr Thr Thr Arg
220      100      105      110
222 Tyr Asn Ala Pro Ser Ile Asp Gly Asp Arg Thr Thr Phe Thr Gln Tyr
223      115      120      125
225 Trp Ser Val Arg Gln Ser Lys Arg Pro Thr Gly Ser Asn Ala Thr Ile
226      130      135      140
228 Thr Phe Ser Asn His Val Asn Ala Trp Lys Ser His Gly Met Asn Leu
229 145      150      155      160
231 Gly Ser Asn Trp Ala Tyr Gln Val Met Ala Thr Glu Gly Tyr Gln Ser
232      165      170      175
234 Ser Gly Ser Ser Asn Val Thr Val Trp
235      180      185
238 <210> SEQ ID NO: 6
239 <211> LENGTH: 211
240 <212> TYPE: PRT
241 <213> ORGANISM: Clostridium acetobutylicum
243 <400> SEQUENCE: 6
244 Ser Ala Phe Asn Thr Gln Ala Ala Pro Lys Thr Ile Thr Ser Asn Glu
245 1      5      10      15
247 Ile Gly Val Asn Gly Gly Tyr Asp Tyr Glu Leu Trp Lys Asp Tyr Gly
248      20      25      30
250 Asn Thr Ser Met Thr Leu Lys Asn Gly Gly Ala Phe Ser Cys Gln Trp
251      35      40      45
253 Ser Asn Ile Gly Asn Ala Leu Phe Arg Lys Gly Lys Lys Phe Asn Asp
254      50      55      60
256 Thr Gln Thr Tyr Lys Gln Leu Gly Asn Ile Ser Val Asn Tyr Asn Cys
257 65      70      75      80
259 Asn Tyr Gln Pro Tyr Gly Asn Ser Tyr Leu Cys Val Tyr Gly Trp Thr
260      85      90      95
262 Ser Ser Pro Leu Val Glu Tyr Tyr Ile Val Asp Ser Trp Gly Ser Trp
263      100      105      110
265 Arg Pro Pro Gly Gly Thr Ser Lys Gly Thr Ile Thr Val Asp Gly Gly
266      115      120      125
268 Ile Tyr Asp Ile Tyr Glu Thr Thr Arg Ile Asn Gln Pro Ser Ile Gln
269      130      135      140
271 Gly Asn Thr Thr Phe Lys Gln Tyr Trp Ser Val Arg Arg Thr Lys Arg
272 145      150      155      160
274 Thr Ser Gly Thr Ile Ser Val Ser Lys His Phe Ala Ala Trp Glu Ser
275      165      170      175
277 Lys Gly Met Pro Leu Gly Lys Met His Glu Thr Ala Phe Asn Ile Glu
278      180      185      190
280 Gly Tyr Gln Ser Ser Gly Lys Ala Asp Val Asn Ser Met Ser Ile Asn
281      195      200      205
283 Ile Gly Lys
284      210
287 <210> SEQ ID NO: 7
288 <211> LENGTH: 206
289 <212> TYPE: PRT
290 <213> ORGANISM: Clostridium stercoarium

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292 &lt;400&gt; SEQUENCE: 7

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293 Gly Arg Ile Ile Tyr Asp Asn Glu Thr Gly Thr His Gly Gly Tyr Asp
294 1 5 10 15
296 Tyr Glu Leu Trp Lys Asp Tyr Gly Asn Thr Ile Met Glu Leu Asn Asp
297 20 25 30
299 Gly Gly Thr Phe Ser Cys Gln Trp Ser Asn Ile Gly Asn Ala Leu Phe
300 35 40 45
302 Arg Lys Gly Arg Lys Phe Asn Ser Asp Lys Thr Tyr Gln Glu Leu Gly
303 50 55 60
305 Asp Ile Val Val Glu Tyr Gly Cys Asp Tyr Asn Pro Asn Gly Asn Ser
306 65 70 75 80
308 Tyr Leu Cys Val Tyr Gly Trp Thr Arg Asn Phe Leu Val Glu Tyr Tyr
309 85 90 95
311 Ile Val Glu Ser Trp Gly Ser Trp Arg Pro Pro Gly Ala Thr Pro Lys
312 100 105 110
314 Gly Thr Ile Thr Gln Trp Met Ala Gly Thr Tyr Glu Ile Tyr Glu Thr
315 115 120 125
317 Thr Arg Val Asn Gln Pro Ser Ile Asp Gly Thr Ala Thr Phe Gln Gln
318 130 135 140
320 Tyr Trp Ser Val Arg Thr Ser Lys Arg Thr Ser Gly Thr Ile Ser Val
321 145 150 155 160
323 Thr Glu His Phe Lys Gln Trp Glu Arg Met Gly Met Arg Met Gly Lys
324 165 170 175
326 Met Tyr Glu Val Ala Leu Thr Val Glu Gly Tyr Gln Ser Ser Gly Tyr
327 180 185 190
329 Ala Asn Val Tyr Lys Asn Glu Ile Arg Ile Gly Ala Asn Pro
330 195 200 205

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333 &lt;210&gt; SEQ ID NO: 8

334 &lt;211&gt; LENGTH: 211

335 &lt;212&gt; TYPE: PRT

336 &lt;213&gt; ORGANISM: Ruminococcus flavefaciens

338 &lt;400&gt; SEQUENCE: 8

```

339 Ser Ala Ala Asp Gln Gln Thr Arg Gly Asn Val Gly Gly Tyr Asp Tyr
340 1 5 10 15
342 Glu Met Trp Asn Gln Asn Gly Gln Gly Gln Ala Ser Met Asn Pro Gly
343 20 25 30
345 Ala Gly Ser Phe Thr Cys Ser Trp Ser Asn Ile Glu Asn Phe Leu Ala
346 35 40 45
348 Arg Met Gly Lys Asn Tyr Asp Ser Gln Lys Lys Asn Tyr Lys Ala Phe
349 50 55 60
351 Gly Asn Ile Val Leu Thr Tyr Asp Val Glu Tyr Thr Pro Arg Gly Asn
352 65 70 75 80
354 Ser Tyr Met Cys Val Tyr Gly Trp Thr Arg Asn Pro Leu Met Glu Tyr
355 85 90 95
357 Tyr Ile Val Glu Gly Trp Gly Asp Trp Arg Pro Pro Gly Asn Asp Gly
358 100 105 110
360 Glu Val Lys Gly Thr Val Ser Ala Asn Gly Asn Thr Tyr Asp Ile Arg
361 115 120 125
363 Lys Thr Met Arg Tyr Asn Gln Pro Ser Leu Asp Gly Thr Ala Thr Phe

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VERIFICATION SUMMARY

PATENT APPLICATION: US/09/856,025

DATE: 05/29/2001

TIME: 15:55:31

Input Set : A:\W098519.txt

Output Set: C:\CRF3\05292001\I856025.raw

L:10 M:270 C: Current Application Number differs, Replaced Current Application Number  
L:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date